

Introduction :

~~Easter weekend.~~ The benefit of having a precious extra two days available for Reefsteamers Depot work were somewhat off-set by the fact that many of the Reefsteamers gang would be away with their families. (There is a big, wide world outside the Depot gates, after all.) Nonetheless, the old Spoories, occasional retirees and the bachelors were at the depot. We ran two trains this weekend as well, which is never good for depot work with half the staff riding the rails. Nonetheless, we managed to get some more work done on the Class 15F No.3052 Avril, the club house and the hydraulic coal grab wagon.

The main work of the day was the re-assembly, re-fit and the testing of the Class 15F No.3052 Avril's brake ejector. Everything else was mainly painting and cosmetic work. The vacuum produced by the newly overhauled replacement ejector was very disappointing and this project turned out to be a late night job of testing, visual inspection and elimination of causes. The entire ejector was eventually swapped out to the original (with which the engine ran from Ficksburg), to no real avail. During the afternoon, a bad split was found in the 2 inch diameter vacuum line on the locomotive where did THAT come from? The brake problem turned out to be a simple problem, as identified by an experienced ex-railway person but you'll have to read the newsletter to find out what it was. The rebuilt ejector now works great (Yay!) and the workshop team took their lumps and learnt a lesson of experience. It sounds negative, but that is how valuable experience is gained.

But, on with the report!

SIA PROJECT : A 125 ton Beauty Salon session:

FP01 Struttin her newly painted (and repaired) stuff, 15F No.3052 Avril is now running in the livery that she originally wore when she was retired and first passed into the private ownership of Dave Shepherd. (Which was in 1991) (Pic by Shaun Ackerman)

A lot of work has been going in our glamour girl Class 15F No.3052 Avril to make her even more presentable to the public, even if they do often tend to only notice the shiny bits. (Much to our disgust, at times.) But some of that recent work has been restoration type work to get the locomotive back into a previous recorded state, rather than merely just looking smart. Up to this point the smokebox and the front wind deflectors (The angled panels under the smokebox door) had been painted, the foot walk sills painted, wheels and frames done as well as brass work polishing and sourcing a set of temporary cab number plates. But the smoke deflectors were a bit of an issue.

Traditionally, South African Railways steam locomotives are plain black all over, somewhat to the dismay of those that like distinctly coloured liveries. The buffer beams are traditionally red as a warning colour and the frames are usually painted red to render crack spotting a little easier. I must admit that I myself sometimes find semi-gloss midnight-in-a-coal-mine black a little boring and sometimes wonder if it wouldn't be nice to have more locomotives in the roster all painted in distinctive but dignified colours. But then come the associated paint-related problems. It's hard enough to keep a predominantly black coal burning locomotive clean it must be a nightmare to clean, say, a Caledonian blue machine. I've seen black steam locomotives that have taken two days to clean and paint, only to get fouled up within 30 minutes of on-shed movements and already needing a boiler rub down. Furthermore, should the multiple livery approach be adopted, the various colours of paints have to be stored and matched in the store rooms. Furthermore, the plain black uniformity does admittedly look smart black, with white and red accents, looks good for double headers. Sort of like a bachelor (like guess who) only buying black socks even the odd pairs naturally match up even if they are different heights. And a lovingly cleaned, black locomotive is a great backdrop that really highlights the details and the beautiful burnished hue of the brass, copper and that of the stainless steel boiler-course bands.

So, authentic Zimbabwe-midnight black it is!

And black Avril was except the smoke deflectors. When Dave Shepherd was presented with this locomotive (in return for a painted picture of the same!), she was running with battle-ship grey smoke deflectors picked out with blue lining. The tender frames, tender bogies and the Bissel Truck were also in grey paint when the locomotive was presented in 1991. The Class 25(NC) No.3444 Elsabe (Currently in storage for Friends of the Rail) ran with pale blue deflectors with azure blue lining, so it wasn't too unusual. But over the years, No.3052 Avril ended up with classic South African Railways plain black deflectors with white edge-lining.

Dave Shepherd requested a cosmetic restoration back to as she was. He was diplomatic as can be but pulled owners rank saying that she does admittedly look great as she is, but after all, it is MY locomotive! So, dear old Avril soon ended up with a pair of plain grey smoke deflectors! She didn't look too bad in her as delivered-from-Ficksburg state (Pic L01 below), just rather dusty and dull coated. A part of the issue and the reason for Dave's diplomacy was that Reefsteamers had ALREADY taken it upon themselves to repaint the locomotive prior to her debut run and thus we'd already repainted the wheel centers, the wheel rims, the buffer beams, the compensating links, the frames, tender frames and bogies, etc but all in gloss black, white or red as required. Naturally, we stuck to the default, authentic all-black SAR paint scheme with the very common customization of white walkway sills and wheel rims. Thus, the new as delivered gloss-grey painting job was actually done over a new two week old paint job done out of high regard for Mr. Shepherd. Oh well, except for rounding of the edges of the exposed hex nuts and bolts, you can't go wrong with a protective extra coat of paint on a 60 plus year old piece of rolling steel.



L01 ☞ Avril in her as-delivered paint scheme. Note the plain black un-badged SAR style smoke deflectors and the custom bulls-eye driver wheels. Also notice the lack of a cab number plate and wing heralds.



L02 ☞ Gloss-grey painted tender frames and bogies just as delivered, Mr. Shepherd.



L03 ☞ Grey painted Bissel truck. Notice that this engine uses roller bearings on the trailing axle. The red painted beam to the left is the compensating beam.

Pictures L02 and L03 (both above) show some of the just repainted gloss grey highlighted details. Pic L04 (below) shows that the black, red and grey combination is actually quite harmonious, but that grey is going to take some cleaning in regular operation! My HO Scale Cascade Falls Railroad (RIP) used to run in black, mid grey and orange, not too far off from Avril's new-old colour scheme, so it brought back memories. The smoke deflectors were painted during the following week (Pic L05 below) and the ☞Germiston☞ wing heralds were also repainted from having a ☞Signal Red☞ background to ☞Alpine Sky☞ Blue. (The same colour as our Class 15F No.3016 ☞Gerda☞)

Lee Gates was put to the job of painting the embossed brass SAR oval cab plates, and some of that blue was borrowed to line out the plain grey smoke deflectors. The original proposal was to use automotive type pin-striping for a quick solution. But would that stand up to the rigors of use on a locomotive? It took three fellows to lay out the masking tape for the pin striping and they did a remarkable job of keeping everything lined up and parallel to the edges, while standing in their awkward positions. The corners were painted freehand though. (Pic L06 below) The grey background paint had been applied generously and with no runs ☞ so it served to smooth out the rough surfaces. Thus, it was easy to prevent the dark blue paint sneaking under the tape ☞ and resulted in a sharp striping job.

It's always good practice to add stripes to a steam locomotive. It breaks up the outline and makes the locomotive less conspicuous when hiding in a car park, and the go-faster effect should add about 5kph to the top speed.



L04 ☞ The grey, black and the red all meet in fine style on the rear corners of the tender.



L05 ☞ Reminding one of the old Easter tradition of wearing a new Easter hat or a bonnet, Avril sports shiny grey smoke deflectors as she is shunted into the reception track for fire lighting on Good Friday.



L06 ☞ Locomotive pin striping. Notice that the curved corners are being hand painted.

It must be admitted that we were skeptical about what we thought the locomotive would end up looking like with a slightly ☞pimped-up☞ non-SAR front end ☞ but we were surprised that it looks quite ☞sharp☞ in the metal.☞ Those unique smoke deflectors help to highlight this locomotive as a special locomotive with a unique story. They also have the additional advantage of making the locomotive visually distinctive to non-steam literate members of the public too.

You can see what she looks now in the fronts-piece lineside photo FP01 above. Not bad, hey?

Lee Gates, meanwhile, was tasked to apply his artistic skills to painting the multi coloured cab number plates. ☞Avril☞ has ☞lost☞ her ☞3052 15F☞ number plates and arrangements have been made to have reproduction plates made. In the meantime, the locomotive has a plain white number stenciled on the cab sides. (Pic L07 below) To cover up those numbers, we are temporarily using the number plates from one of our non-running 15F's (No.3046 ☞Shaun☞) As you can see in Pic L08 (below), the red, black and green colour scheme doesn't suit the new grey and black colour scheme of the locomotive.

The smallest functional paint-brush we had was a 3/4 inch and so it made this task into a fiddly job with paint getting up on the letters. The many nooks and crannies were painted with a combination of finger tips and screw driver blades used as pen nibs. My mind was running with the old English pub invitation ☞Ticky boo, eh?☞ Only my warped brain converted the phrase to ☞Tricky Blue☞ to commemorate this colour. In most light, including direct, this ☞Alpine Sky☞ is so dark as to look black, and then it suddenly pops up as a muted blue colour at an angle. (Pic L10 way below) A tricky blue indeed.

Our Class 15F No.3016 ☞Gerda☞ does the same trick and has surprised a number of photographers who honestly thought they were taking pictures of an SAR black locomotive.



L07 ☞ Plain-Jane stencilled cab numbering. It doesn't look too bad, but reminds us steamers of the scrawled white graffiti numbers roughly sprayed onto the cab sides of to-be-scrapped locomotives.

L08 ☞ An unusual multi-coloured locomotive badge in red, green and black. Remember that this is a borrowed cab number plate while new plates for No.3052 are being made.

L09 ☞ An artistic genius at work, guiding that sticky, stiff paint brush through the brass relief obstacle course. What a job!

The plates were remounted on Good Friday and half polished with an ear-bud sized piece of steel wool and what I thought was a can of Brasso. It turned out to be Brasso-coloured paraffin, which I only discovered after the job ☞ but I thought it was a bit runny! Thanks a lot, Oom Attie! I won't mention the tumble that I took when the angle-topped foot step flipped over forward under my feet. Oh, I just did. (Yeah ☞ I'm accident prone! pay for this hobby in blood n☞ bruises n☞ stressed tendons.)

The badges were polished up properly on Easter Sunday with a decent wad of fine steel wool to get the overlapped paint off and a carefully checked Brasso can with carefully checked genuine Brasso. The new paint job is disappointingly rough with the difficulty of painting with a too-wide brush, but at least the ☞Tricky Blue☞ matches that of the new smoke deflector pin striping and of the ☞Germiston☞ shed wing heralds.

Another Lee Gates job was the painting of the tender deck, the original condition which is shown in Pic L11. (Below.) Only the water chute and the scuttle plate are visible from the ground. But the paint on the entire deck was badly worn and the tin worms were just starting to get a hold. The new patch in the scuttle plate was starting to rust too. It looked like being a dreadful job to do in the summer afternoon.

Actually, it wasn't so bad, once Stewart Currie pointed my way to a functioning wide paint brush. That paint deserves special mention as it was an industrial Polyurethane with an industrial stench. I had in mind dog putty that had been left to soak in a bucket of warm dish-washer dregs for a week. It really stank and I was grateful to be painting out in the open fresh breezy air and not in the confines of the shed. But those fumes got around. I was amused to see several people walk by the tender, unaware I was high up on the deck ☞ and suddenly stop dead with wrinkled noses and comically looking around everywhere but up. Shaun Ackerman popped up to check on progress and commented on the smell. He hadn't yet ☞clicked☞ that it was the paint and took a typically boisterously Ackerman-sniff right up to his ears in the almost empty paint bucket ☞ and froze, with an explosive plastic-echoed blanch. It reminded me of a draft horse coughing into his nosebag. I was thinking ☞Yeah! Breathe deeply, Big Boy!☞ He pinned the smell's description down even more accurately. Blocked Drain. Yeah. A back-alley restaurant drain juicily backed up, with the manhole cover steadily weeping luke-warm, pale grey water and oozing grease clots in the sun.



L10 ☞ The ☞Tricky Blue☞ is revealed nicely in this angled camera flash.



L11 ☞ An empty palette aka one rusty tender top with a patched scuttle plate.



L12 ☞ Freshly painted tender deck doesn't actually gleam in the sun, but looks a lot neater and should help prevent future corrosion.

That tender deck, actually the top of the water tank, had to be swept several times to get the collected dust and cinders off. But apart from the hassles of chasing the dust away from the wet paint, and trying not to breathe too much, the job went well. (Pic L12 above) This paint covers well and dries incredibly quickly in less than five minutes. (But still smells.) Of course, the sun-drenched heat of the metal deck might have had something to do with that and it is the first time I've seen paint literally steaming from under a paint brush.

I was careful not to paint myself into a corner and backed towards the steps at the rear left. The paint ran out, unfortunately and so Avril is running with a bare patch at the steps. But at least the bits visible from the ground and from platform height are neatly painted in grey.

SIA TASK : Class 15F No.3052 ☞Avril☞ Fire Lighting and Preparation :



Getting number 3052 [Avril](#) all steamed up for her next trip had a few wrinkles. However, the old Bean Boiler actually steamed up very well, reminding us that this is a good machine and an [eager-steamer](#), in spite of the recent issues we've been having with the auxiliaries. Those issues will be gradually resolved as we continue to get this engine into shape for main-line type service. She has all the looks of being a top-performer.

Fireman Sakkie [Sakana](#) Kekana did the fire-lighting honours before schedule on Saturday night, laying down a new fire and then banking it almost immediately. Most of the club members were at the annual meeting for the Centurion Live Steamers on this day. Normally, we light up a locomotive's fire at about 10am in the morning, and the locomotive is ready to be handed over to the shunter and the shed man at about 4 in the afternoon, although they can usually move under their own power at about 1-2pm. But we wanted to allow extra time for testing and possible fault finding of the newly overhauled brake ejector. (Which is a story on its own.) Shaun Ackerman does the rostering for Reefsteamers, setting times, sharing times equally amongst the active footplate crew and also the schedules for the trainee firemen, fire lighters and locomotive minders. Shaun had set the time forward to 8am [2](#) hours earlier.

Sakkie had beaten that and had the locomotive boiler warm with a banked fire all night and presented us with a flat, warm biscuit of a fire by 8am. There wasn't any steam pressure showing on [The Big Gauge](#), but the firebox and boiler were at least warm n' cozy. Lee was the trainee and both of them worked at different ends of the locomotive. Sakkie set up the front end with the blower ring in the chimney to draw the draft, and cleaning out the char chute under the smokebox. (Pic F01 below) He also put in the first round of coal onto the banked fire.

Lee [Flash](#) Gates got busy trimming the dusty diamonds in the capacious tender, doing the coal dance and pushing a convenient helping of coal forward onto the shovel plate to be in easy reach to feed the flat-fire for the first time. The dancing part comes in trying to keep the stoker trough clear. The [gobble-hole](#) (The exposed stoker worm-screw) was 7 slides back and deeply buried under the receded coal pile left from the last trip. (Pic F02 below) When the tender of a mechanically stoked locomotive is to be re-coaled, the slides on the stoker trough need to be pushed back, to bring the active area towards the front. As the coal is burnt and the coal pile shrinks, each individual slide is pulled towards the front from beneath the leading edge of the coal pile, leaving a hole behind it. Thus, the active pickup area of the mechanical stoker gradually moves backwards through the tender. That's all well and good, but the slides need to be reset after a run, and that's a nuisance when the coal pile isn't completely finished.

The job sounds dreadful, but it was actually a pleasant warm-up job in the cool of the Easter Sunday morning church time. I even quietly sung a few hymns to the scraping-cadence of the shovel. [Avril](#) took three shovel plate loads of coal before we used the stoker for the first time. (At about 300kPa)



F01 [Sakkie](#) wields the short-shovel to clean up the leftover smokebox char from the front deck. This turned out to be well timed as this was the area upon where the brake vacuum pipes would be removed later on that day.



F02 [The shovel plate](#) after the first helping of coal. Looking through the coal doors behind the front heap, you can see that the stoker slides are all closed. The [gobble-hole](#) is buried two slides in the heap at the rear.



F03 [Exciting job](#) sweeping out the cab. But it made the day's work more pleasant. We didn't want to just later on blow out the splinters into the grass with the spray pipe, because of the 24 doggie paws in the vicinity.

Lee also took some time to sweep out the cab (Pic F03 above), which was pretty dirty from the recent gauge relocation and piping work, as well as the ejector overhaul and installation project. [Avril's](#) cab floor is rotten and there were many splinters remaining from a recent patch that was done, as well as two more planks that were breaking up at the driver's steps. Sakkie then joined in, and they cleaned up the upper surfaces of the draft gear ledge between the tender and the engine, which collects much coal and dust over time.

Recently it seems as if Pixar Animation and Dreamworks Studios have gone nuts on animated rats lately, producing [Ratatouille](#) and [Flushed Away](#) respectively. We Reefsteamers just nail the twitchy little critters and there were four dead [muns](#) scattered on the grass between the reception track and the articulated coach set. So I quite literally scraped them up with the shovel and disposed of them within the locomotive's fire. (Pic F04 below) Meanwhile, as those rodents were starting to char, and the ratty-fumes were percolating through the boiler tubes, Sakkie Kekana was up on the smokebox and withdrawing the blower ring. I wrestled with my conscience. Should I tell him what's going up in the smoke that he's currently breathing?

Nah



F04 [Rodent Rites](#). Lee Gates demonstrates the dying art of footplate cooking with four dead rats [cooking](#) them within their furry hides keeps the juices in, you know.



F05 [Victor Mienie](#) on his first Depot Day, trying out the tasks of fire-lighting as a hopeful trainee fireman. We worked him hard-ish but he enjoyed his day with us.



F06 [\(Prev week\)](#) Oom Attie cleans the left side of the fire box with his secret blend of oils, wax and paraffin. This is a tricky area to clean on a live locomotive because of the heat, and that very hot injector steam line.

We had a young man with us today, a fellow by the name of Victor Mienie. (Pic F05 above) He's 15 years old and wants to train up as a fireman. When I heard, the first thing I did was to tap his chest and give his biceps a squeeze although I didn't quite go so far as tip his head back to look at his teeth. (like a horse.) He's a short, plump, but well built fellow, with strong arms which is the ideal build for firing. Victor is from a railway family. His grandfather is one of the old RS drivers who is still active in driver and assistant training for Transnet. He can start official footplate training when he turns 18. We got on well together, conversing in the most hilarious linguistic stew of bad English and even worse Afrikaans but we could basically understand each other. It's always good to see younger people interested in steam, in a culture where full sized and model steam engines are often dismissed as "old men's toys."

Class 15F No.3052 "Avril" had a good bath the previous week. Unfortunately, you can't just dunk a loco in a tub and rinse it off with a hose and a snip-sachet of doggie shampoo. Attie de Necker and Sakkie Kekana had spent several hours the previous week rubbing and cleaning the big beast of a locomotive down by hand (Pic F06 above) there are no shortcuts. It can take an afternoon just to clean the wheels, the motion and the frames behind them.

Some painting was required too, around the newly cut down gauge plate and also some of the mounting hardware behind the lubricator. (Pic F07 below.) Meanwhile, a pair of wide floor boards came up on the driver's step-side, leaving a broken off chunk under the step header rail and some remains of cross braces. Lee started the job by cleaning the area down to the pitted metal work. (Pic F09 below) Andre van Dyk, who had arrived to prepare the locomotive for his fireman's run on the morrow, ended up as the carpenter.



F07 "Picasso de Necker" paints behind the lubricator. Notice the five sight glasses a characteristic of a mechanically stoked locomotive oil being fed to the two valve chests, the two cylinders and the stoker steam intake. (A hand bomber's lubricator only has four sight glasses.)



F08 The wobbly floor in the ball room. "Avril's" floor boards are nearly all soft splintery and coming loose from their mountings. This loose plank on the fireman's side was repaired last week.



F09 Two planks came up on the driver's side, revealing rotten cross braces, termite dust, splinters, coal dust and fluff. You're looking down at the steel under tray after cleaning, but before the angled step cap was removed.

Andre simply broke up some old wooden pallets and cut them down, being careful to get all the original nails out. It sounds like a simple job but the plank ends were not to be cut evenly as there's a slight taper at the cab's toe board. They weren't able to use a power saw either. (No electricity.)

The new narrow planks were screwed into place not just wedged. (Pic F10 below) This is untreated pine and won't last very long (but good enough for a few trips). We'll eventually re-lay the floor with longer lasting hardwood and take the effort to match the edges to the taper as well. The new floor stayed clean for about, oh, like 5 minutes. (Pic F11 below) Oh well, it will soon blend in with the existing weathered and coal-tinted wood. Actually, we aren't usually so dirty, but there was a lot of wet coal dust and chunks in the vicinity of the loco steps.



F10 Victor (Bottom) and Andre lay fresh planks on the Driver's entrance side.



F11 Wouldn't our shiny floor obsessed mothers be pleased to see this!



F12 The oil lines for the Stoker Motor's gearboxes. These protrude through the left tender frame and accept graphite grease.

From on the cab deck to under the tender. Shaun Ackerman and Andrew King got busy with some more greasing and lubrication. I didn't get any pics of this job though. They were held up badly by a failed grease pump and had to waste time fixing the pump rather than the engine. The main lubrication work was that of the bolster pin pivots as well as the brake linkages. The stoker's gearbox was also filled up with graphite grease pumped in fresh through the convenient externally mounted grease points. (Pic F12 above)

The locomotive was in steam well ahead of time, even though we didn't hurry the fire along. Even with the delay caused by a failed grease pump Shaun and Andrew had plenty of time to test and come to grips with the newly installed brake ejector.

SIA Project "Class 15F No.3052 "Avril" Brake Ejector Overhaul :

No.3052 "Avril" misbehaved on her debut run to Magaliesburg several weeks ago and ran up a list of faults to be repaired. Amongst the usual adjustments and the routine tightening of glands, the three biggies on the list were the badly leaking lock cylinder of the power reverser, the failed grate shaker and the poor performance from the brake ejector, which had to be held in "release" to just keep the brakes off. The grate shaker and the reverser had already been repaired, leaving our senior steamers wrestling with the brake ejector. It was removed and dismantled three weeks ago, and once taken home by Shaun Ackerman in order to measure it up and fit it with new valve seats manufactured on his model steamer equipment.

As an example of Reefsteamers having to fabricate and rebuild parts, I present to you a cam follower and a valve limit pin.

The ejector arrived back at the depot with no new dents, all the valves re-installed and the custom-made valve seats carefully seated all the way home onto their ledges. One of the outstanding jobs was the fabrication of a new limit pin, which was done two weeks ago. Rather than guess, an electronic CAD drawing was consulted. (Pic E01 below) We are slowly getting used to the sight of a HP laptop resting on

the worktable of a drill press, carefully placed on a sheet of fresh newspaper. It's not as dangerous as it sounds as there was no live steam in the air this day. Basically this day's ejector work was the reassembly of the external fittings and fixing up the vacuum valve, and then getting the big brass lump back onto the backplate where it belongs.

A problem discovered with the original set up was that the main air clack valve wasn't operating properly. It was found to be a combination of an incorrect limit pin and a very worn can follower. The new valve limit pin was measured up and turned down in the lathe from a 15mm stainless steel rod. (Pic E02 below) The barrel is in two diameters. This was done using the tailstock of the lathe, and a thread die-nut held in the chuck. (Pic E03 below) The lathe wasn't powered to cut the thread but being turned over by hand, the chuck providing a bit of leverage.



E01 A blend of modern technology and vintage machinery. Here's a CAD drawing on an ejector vacuum valve. The L-shaped object in the center is the valve lifter and the cam is clearly visible middle-right.



E02 The new lifting pin is being turned down from 15mm stainless steel stock on the lathe. That small hex-head took some centering before the bolt would spin straight in the lathe's chuck.



E03 Cutting the threads by hand, using the lathe chuck as a hand-powered die-nut spinner.

The first attempt at a test fit wasn't successful as an incorrect measurement had been made concerning the depth of the thread. There was some gentle jibbing between the senior-steamers about the basic use of vernier calipers and compensating for thread depths. The entire job was performed again and this time the lifting pin fit perfectly, with no discernable side-play whatsoever. The valve is now able to lift correctly from its seat with sufficient lost motion and travel. You can see a test fit in Pic E04 (below). The valve itself is being held inverted with the guide vanes clearly visible pointing upwards.

The cone covers and access covers were replaced, each one being carefully sealed and locked with a generous application of LockTite thread treatment. (Pic E05 below) The Stag sealer so frequently used by Reefsteamers for piping and flange work isn't really suitable for high temperature threaded applications as it remains soft. The LockTite is more for sealing rather than preventing the threads working loose. Loose covers not only hinder the efficiency of the ejector, but loose covers with steam behind them are both annoying and dangerous to the driver as the ejector sits right in front of his face. Worn and leaking rear facing cone covers are a particular annoyance.

But, back to the job. The sealing face of the vacuum line was carefully dressed with a file. (Pic E06 below) This would be later be fitted with a custom made gasket but for now, the slightly corroded brass was skimmed up to a shiny finish on the lathe and the worn, rounded spanner flats also dressed up with a file.



E04 Test fitting a new valve limiting pin. The wider head prevents the valve from lifting so far as to disengaged the guides from the seat when operating.



E05 Installing a valve cover. Notice the fresh red bead of LockTite thread locker fluid being used as a high temperature cap sealer.



E06 Dressing the sealing surfaces of the vacuum pipe union. This is the face on which the gasket would bear.

The vacuum pipe union went on by hand with little trouble with cleaned, reconditioned threads. (Pic E07 below) Shaun forgot the union nut that had to go behind the sealing face, but luckily remembered before the pipe union went fully home and squashed the sealing bead. (Pic E07 below) It looks a treat with the surfaces cleaned on the lathe, but more importantly, the spanner flats will ease removal for future work. While other work was progressing on the ejector, Andrew King got going with the ball peen hammer and tapped out a brand new gasket. (Pic E08 below) No way were we going to try and re-use the flattened original.

I wasn't the only audience, Sakkie Sakana Kekana came moseying out for a look at the ejector, even though he was officially off duty at the time. (Pic E09 below.)



E07 The new vacuum union is being screwed in by hand - testimony to the cleaned reconditioned threads. Note the retracted union nut which is



E08 In one of the many positional adjustments of the ejector in the vice, Andrew finds a convenient angle to opportunistically tap out a new gasket



E09 Fireman Sakkie Sakana Kekana checks out the disembodyed ejector with interest - imagining the day he will be on the right hand side of the footplate

The next job was to make a new bolt to serve the function of a valve seat retainer. (Pic E10 below) These two bolts don't physically engage with the seats, but rather their outer ends press into the sides of the threaded seats and functions to stop them from turning. This makes the length of the bolts critical. Too long and the valve seats will be distorted as the bolts are screwed in all the way home. Too short, and only the threads between the valve seats' outer circumference and the brass casing would keep them in place. This means the bolts have to be individually cut and fitted, and possibly shimmed with precision washers. An otherwise competent fitter who's unaware of this issue may damage the valve seats, or leave them without safety locking, just by mixing existing bolts up.

Andrew 'Noddy' King had been mysteriously gone for most of the morning. He's normally like steel shavings around a lathe always there. He'd taken a worn valve lifter from another ejector to his workshop where he's employed, to weld it up and then roughly grind it back down to the original profile. (Pic E11 below) It would be impossible for Andrew to match the profile exactly without dimensioned drawings or an original spec casting to guide him. And these ejectors all wear slightly differently anyway. Still, he did a remarkable job of building up the cam follower part of the valve lifter to a workable profile.

So the built-up valve lifter was fitted, through a remarkably small hole which caused some cussing! Hardly room for the knuckles much less the hand. The valve assembly is spring loaded and there was some difficulty in engaging the two stirrup-like claws. And then the center hole on the lifter had to be lined up for the insertion of the spindle. (Pic E12 below) No, not an easy job at all. One would need the hand of a gynecologist or an obstetrician to do this job with a small profile and strong fingers.



E10 One of two valve seats retainer bolts that have to be carefully cut and machined to fit against each valve seat exactly. (The ejector is upside down in this picture.)



E11 A rebuilt valve lifter \ cam follower is shown to the left while the worn unit from Avri's ejector is shown to the right. No wonder the air valves weren't opening.



E12 The valve lifter after being wrangled home and the pivot pin has been half installed. The valve is heavily spring loaded, which added to the fun.

The removable cam (Pic E13 below) was then fitted to the camshaft and the camshaft was re-installed. This is tricky as it passes through two glands in the housing (One visible in Pic E10 above) and has another cam on the leading end. The slot-machine-like brake lever was put loosely back onto its square shank and the turning action checked. The initial action was reasonably smooth but the follower profile was too high. The cam and the valve lifter baulked. The driver would have felt that the lever doesn't want to go all the way horizontal when applying his brakes.

The valve lifter was removed with the same irritating caesarian puzzle. It was then clamped in the drill press vice and carefully filed down, with special effort taken to keep the profile round. (Otherwise it would put a false notch into the movement of the brake lever.) This removal and re-fitting process was done three times before the valve action's tactile feedback was deemed satisfactory. (Pic E14 below) That's why they call the job 'fitting'. And it was done with the knowledge that the valve action and/or tactile response would probably be different when the ejector is hooked up and functioning under steam.



E13 The removable cam. You can just see one of the re-dressed cam profiles at the lower left.



E14 The cam follower is being carefully re-profiled to bring the valve lift back into spec.



E15 Detail of the end of the brake lever. Notice the annotated three positions of the lever. (Off \ Aff) (Run \ Loop) (On \ Aan)

After this persistent fitting and removal, and the cam follower profile deemed acceptable, it was time to button up the bearing nut and the gland nut of the ejector. (Pic E15 above) This was done with ease but that protruding hex nut for the valve lifter pivot (bottom left) really messes up the access to the two nuts. (Pic E16 below) Naturally, the sealing faces were all LockTite sealed. The assembled brake valve lever feels much firmer with a tighter valve train and a tighter set of sealing glands a fact that the drivers will have to get used to.

With a little more attention, and a quick tweak of the two castellated gland nuts halfway along the camshaft, the ejector was deemed to be complete. What's awkward about these beasties is that you never really know if they'll work, until you've gone to all the effort of connecting them up and testing on a live steam engine. In the meanwhile, the ejector was laid to rest in a barrow (Pic E18 below) and the fitters went off for a well earned cup of tea.





E16 Spinning in the nuts with a loose spanner, before laying it flat for the final tightening. The hex head for the pivot, visible just below the spanner, blocked access. The grid above the spanner is the air intake.



E17 A pair of castellated gland nuts halfway along the cast-iron shaft, which is visible spanning the two. These should be tightened by means of a c-spanner, not by a hammer and punch as we've so often seen evidence of being done.



E18 The finished ejector is waiting in the wheel barrow, which also helps to give a sense of scale to this large, beautifully convoluted brass casting.

The ejector was refitted to Class 15F No.3052 Avril late on Good Friday. (Pic E19 below) The locomotive was not in steam at the time so a live test could not be done. But the advantage would be that the pipe work would be cool to the touch, especially if some last minute pipe fitting would be required. Ejector fitting is a two man job but there isn't enough room for two people to get into the driver's corner of the footplate. So one of the team usually has to work from the outside and leaning in through the window. (Pic E20 below) The cab number plate polisher was happy to give up the steps for a good cause.



E19 Newly installed brake ejector. The top pipe is the steam inlet and the bottom pipe is the vacuum line for the train's brakes. You can see the T-junction tap off for the duplex brake vacuum gauge. The small pipe at the lower back leads to the locomotive's vacuum cylinder. Not visible, coming in horizontally through the back, is the steam, entrained air and vacuum discharge lines which blows to waste inside the smokebox.



E20 Locomotive windows invite leaning, but it's not often you find someone leaning in from the OUTside. A confident looking Andrew is standing on portable steps to be able to access the ejector through the window.



E21 Oom Attie finishes the overhaul with some steel wool n Brass. You can clearly see the incoming steam pipe coming in from top left, neatly wrapped in an insulative bandage. The instrument right behind the pipe is the awkwardly placed speedometer.

Well, on Easter Sunday the locomotive was put into Steam for a Monday run, and Shaun n Andrew pounced onto that brake ejector once the steam pressure was 800kPa plus. They knew they'd done a good thorough job on the injector but there's always Gates's Commentary that comes into play. (= Murphy was an optimist.)

The ejector's release notch brought up the vacuum beautifully to just under 20 inches almost scary at how quickly the vacuum gauge needles moved. But the run position simply made the injector roar constantly at about 40kPa (12 inches of mercury). Very disappointing. It wouldn't be enough to pull the brakes off from a train with discharged vacuum cylinders as you need about 50kPa, or about 15 inches to make a very light contact application. The regulations say that you need at least 54kPa showing on run at the brake pipe at the tail end of the train before it is allowed to proceed out onto the steel-ribbon playground. We could barely get 40 and that's not including the leaks of a hypothetical train behind the locomotive.

The fellows first checked the brake lines n Andrew literally stepping down between the locomotive and tender to split and isolate the brake pipe by inserting a brake line dummy. (Pic E22 below) The vacuum picks-up the dummy and pulls it against the sealing rings, blanking off the brake lines. They've been suspicious of the tender brake cylinders for a while. The test was inconclusive and the fault remained.



E22 Tight quarters. Andrew is just inserting the blanking disk into the locomotive side of the tender brake line. You can just see the disconnected tender brake line angling down in front of his forehead. The pipe in the foreground is the water feed for the RHS boiler injector.



E23 Hunt the Hitch. A hopeful search for a classic dumb mistake or perhaps some dirt that got into the injector.

Reluctantly, the boys partially dismantled their, by now, rather warm injector, looking for the possibility that a mistake had been made, or some dirt or fillings got into the works. Although it would have bruised the egos a bit if they had found something in the ejector, it would have been the easier solution. However, nothing amiss was found. The only recourse remaining without opening and blanking the vacuum brake system was a very close inspection of the brake lines.

Eventually, a visible fault was found as a 1 1/2 inch long split was found in the vacuum brake line, right up front behind the angled wind deflector plate under the smokebox. It had obviously been a problem for a while but must have been patched, as the locomotive had passed brake tests previously. A problem with vacuum brake systems is that a patch can get sucked INWARDS rather than be blown off as would be expected on a pressurized pipe. It brought much joy to the boys as they'd found a problem, and some grief for it's quite an awkward location in which to work with big pipe. It's the subject of the next section

SIA REPAIR : Class 15F No.3052 n Avril n Vacuum Brake Line :

The repair of the vacuum brake line was a classic example of a simple job made rather more complicated due to bad access. The 2 inch train vacuum pipe ducks out through the cab floor and alongside the right side of the firebox and along just under the edge of the running board. It's often missed as a visual detail as the vacuum pipe is usually painted black. (Being of galvanized steel and not the more aesthetic copper) It runs the full length of the locomotive, and then ducks into the center line behind the wind deflector plate.

This narrow triangular cavity contains one oil pot, the ledge under the smoke box and the two valve covers. And today, it contained some members of the steam team. Pic 01 (Below) shows the front deck and the brake stand bracket after the pipe had been removed, with the angled wind deflector plate clearly shown.

The holed pipe had to be cut out from behind that angled plate and the entire brake stand dismantled, as there would be no room to turn a pipe back onto its threads. You can see the disemboweled pipes in Pic 02 (Below) and the split visible in the sawn-through dropper pipe in Pic 03. (Below) It could probably have been patched but that's a degradation of standards. And false economy too as the rest of that pipe isn't in great shape.



B01 A view of the stripped down brake pipe stand. That mouse-hole leading out to the front deck plate is the pipe aperture.



B02 A collection of cut up and dismantled brake lines. The black painted pipes are the exposed pipes for the brake stand. The angled pipe at the bottom right is the cross pipe between the running board and the center line. The rusty pipes are the dropper from the running board height to that of the front buffer.



B03 Here's half the split in the very rusty dropper pipe.

Andrew van Dyk, finishing up the afternoon shift of preparing his engine for the next day (As fireman), got busy grinding down the angled stub of the cut down pipe right at the end of the footplate. Meanwhile Andrew and Shaun were out scavenging for a length of pipe and came back with several lengths, including some bumble bee handrail which I thought better not to ask from whence it came. They selected a length of pipe to match, marked it up for cutting using a sand paper strip as a ruler with engineer's chalk (Pic 04 below), and got going with the grinder. Because this wasn't a saw cut, the pipe would have to be turned under the grinder, hence the effort to get the pipe marked up around the entire circumference.

Care was taken to chamfer both the insides and the outsides of the cut edge.

Once the pipe was cut, the ends had to be dressed and then clamped in a pipe press for the threads to be clamped. (Pic B05 below) The leverage was a bit high for the stand and we had Andrew acting as a highly skilled counterweight to stop the rather tall pipe stand from tipping over. (Pic B06 below)



B04 Using a strip of sandpaper as a ruler, the edge of the pipe is marked off square around the entire circumference..



B05 A bit of grunt work cutting threads on a 2 inch pipe.



B06 Andrew acts as a skilled self-adjusting counterweight while Lee takes a turn at the thread cutting. Note the tub of lubricating oil on the floor.

Putting the pipes back together was tricky in the confined space behind that wind deflector plate. The job was made even more interesting by the fact that this engine was in steam, and those cylinder heads and valve covers were getting hot. (Pic B07 below) It was a bit of a monkey puzzle to get all those pipes together again with little space to swing a stilson wrench. The dropper pipe had to be test fitted and then removed once more to cut the other end, with care to allow for the hidden depth of the threads once all the elbows are screwed back on. Eventually the dropper had both elbows inserted after some testing and three-way clamping with safety shows and a pair of bobbejaan (Stilson) wrenches. (Pic B09 below.)



B07 Shaun makes a compact package and looks cheerful behind the wind deflector plate, even though his nuts are roasting gently against the warm cylinder covers.



B08 The troublesome buggler and I don't mean the Chief Engineer. Andrew King sarcastically holds out the newly cut and threaded dropper pipe.



B09 Three men and a baby, or a pipe, in this case. There are two Stilson wrenches in use here so we needed a combination downwards force and sideways restraint.

This mess of piping is actually only attached to the engine at the brake stand, so the exposed front pipes had to be put back in first and the saddle tightened up. (Pic B10 below) Otherwise there would be nothing to turn against when using the wrenches. It still took 2 sets of hands to get those pipes in, without jamming or cross threading. Shaun worked from the side, just in front of the cylinders, using his long arms to advantage while more compactly built Andrew worked through the access hatch looking like he was being eaten. (Pic B11 below)

The job took a while as the Stilson wrenches could only be swung through about 15 degrees and had to be reset for another "bite" after each too-short arc. That's always tricky when working with one of these heavy jumbo-sized wrenches at arm's length. One fellow held the wrench head while the other provided the traction.

To make the final connection, a brake hose was used. The original transverse pipe was bent at an angle of about 10 degrees and we don't have the tools to do pipe bending of that diameter. We could have done a rough job with an acetylene torch and bending the pipe at red hot heat but that would weaken the steel and also burn off the galvanizing. The outside could have been painted to cover the vulnerable exposed DE-galvanized mild steel, but the interior cannot.

The flexible pipe was wriggled on and reinforced with new jubilee clips to make the final connection. (It IS permissible to use a flexible brake hose in a permanent installation.) On the wagons, we normally use glue to make a pipe joint, but this is tighter solution. It does, however, make another check point for the engine's pre-trip road worthy checks.



B10 The brake stand section of the pipe is clamped to the stand to provide something to work against. The dummy pipe has yet to be installed.



B11 Chomp! Andrew looks like he has just slid down the food chain as he wrestles with 2 inch pipes at arm's length.



B12 The flexible pipe used to make the final connection to the angled train vacuum pipe. The front of the locomotive is to the right.

Well, well, and now was time for the ejector test. Unbelievably, there was little difference and the ejector still wasn't up to operational vacuum. It was, however, enough to move the engine round the yards so the evening routine of coaling and turning continued unhindered. The loco minder (Andreas Mathee) had pitched up by then, all unbeknown that he was in for a very interesting night of loco minding.

The engine was backed in and Andrew and Shaun got going with what looked like a very late evening of locomotive work. Attie de Necker did a bunk seeing he would have to report for duty at 4am. The brake testing took on a surreal air with the dangling work lamps back-lighting the drifting steam. (Pic B13 below) The brake pipes and cylinders were carefully checked for any missed leaks, and the overhauled ejector was partially dismantled to check it once more. (Pic B14 below.)

The known-functional brake ejector from Class 15F No.3016 "Gerda" was temporarily installed, to eliminate whether the rebuilt ejector was at fault and it did. The response was pretty much the same so the problem wasn't the rebuilt Ficksburg era brake ejector.



B13 Night shift work on the brakes. Andrew is checking the train-brake vacuum line for leak in the area where it rises from alongside the firebox and runs under the walkway. The flexible pipe in front is the speedometer's signal cable.



B14 yet another ejector check, checking the injector cones by torch light.



B15 The turret manifold, valve spindles and universal joints of the Class 12AR. The 15F's have a two piece manifold which is closer to the cab but the principle is exactly the same.

The problem was resolved when an ex-railways member of Reefsteamers (Johann "Stitch" Versteeg) pitched up and looked over the issue. The problem turned out to be a simple one the ejector's steam feed from the turret valve wasn't open all the way. The valves in the turret manifolds, which supplies steam to all the auxiliaries, are operated by what we call "Spindles." Each spindle has a single universal joint. (Pic B15 above) Sometimes, the joints get cocked and jam and then the shafts lock up, usually on the closing cycle. The result is a valve handle that won't open again and the footplate crew has to manually operate the spindle shaft with a shifting spanner. Sometimes it happens when a valve is over-opened as well, and it needs a spanner to reclose it. But this one had unusually, repetitiously jammed suddenly and tightly halfway through its travel, misleading the operators to thinking that the valve was open against the back stop. Such is the benefit of experience. The rebuilt ejector has been refitted and Avril's brakes are now running a treat.

PROJECT : Hydraulic Coal Grab painting :

Our hydraulic coal grab now matches the rest of the passenger train stock. Well, almost, as it is painted in oxide red instead of the traditional SAR gulf red. It was originally in a faded grey and still marked with the Koedoespoort Engineer's signage. Stewart Currie, Editor of the "On Track" Railway Society of South Africa newsletter, has gradually been painting this scruffy looking machine. Easter Sunday, 23 March marked the milestone with the coal grab all-over red.

Stewart took a lot of care with this job spending about 5 hours on one side of the vehicle, meticulously wire-brushing the rough spots of the old faded grey paint down in clean blue overalls and out in the sun. (Pic C01 below) The checker plate wing extensions on top of the doors were easy to do, but the embossed drop-side doors and the latch channels took more work. The finished job looked quite rough, just like a half finished automotive panel beating job, but it was reasonably smooth. (Pic C02 below.)





C01 📷 Stewart Currie cheerfully tackles a big monotonous job, but one he could work at his own pace 📷 wearing old fashioned oversized goggles over his prescription glasses.

C02 📷 Smooth wire brushed panels. Most of the flaked off paint ended up on Stewart's natty blue overalls.

C03 📷 The master starts with the convoluted sections first. Notice he has his tongue out in concentration as he fills up all the nooks and crannies with the oxide red paint.

Stewart got going on the painting on Easter Sunday 📷 with a mixture of both roller and paint brush work. He started in the latch channels and the hinges with the brush (Pic C03 above) before whacking out the flat areas with a foam roller (Pic C04 below) The coal grab looks smart now. With a tarpaulin over the yellow booms and the engine section, this wagon could almost look like a tarped freight load in a photo freight. Fred Sewell has the resources available to make vinyl decals to put running numbers and bearing markers on the car, or to make stencils so we can spray paint them the traditional way.



C04 📷 The roller finally comes out for the flat panels and the plate work. The size of the photos doesn't really show how smooth the paint job is.

C05 📷 A smart looking freshly painted coal grab as seen from high up the old forge house diesel tank's walkway.

C06 📷 A cleaned-up Stewart takes a well deserved break in the delicious scent radius of the Friday Afternoon braai. Note the lined smoke deflector visible behind him.

PROJECT : Hunslet Taylor Glass :

The little green putt-putt, aka the Hunslet Taylor shunter, is for some attention. This sturdy little engine sometimes gets a bit left 📷left out📷 (sometimes literally) while the steam engines get all the attention. For quite a while, the engine has been running with missing or broken windows in the cab with each pane either having a crack or just being not there. The cab reminds one of a little old lady who has lost most of her teeth. Both the front and rear window frames have only one pane of glass remaining out of the original sets of three.

The glass had been purchased during the week (Pic G01 below) and was tried out for rough dimensions in the evening. Johann Breytenbacht, one of our senior firemen and a long serving member of Reefsteamers, donated the glass. The window frames looks as if they are curved but that's actually only the cutout. The panes of glass are rectangular and actually slide side-to side in rails 📷 like an old fashioned glass-doored kitchen cupboard, or a pickup truck's rear window. This of course leaves the unframed, unbraced individual panes of glass vulnerable to jarring and chipping as they are frequently handled.



G01 📷 Hey, I need some lovin' too! The glassless Hunslet Taylor tackles the weight of two big fat dead steam engines.

G02 📷 Interior view of the windscreen area. Only the (cracked) left hand pane still remains. The lower slide arm can be clearly seen above the instrument panel. The square glass pane actually extends beyond the curved aperture as visible at the top left.

G03 📷 Some new contact lenses for an old lady. The long thin panes are for the doors and the side panes.

SIA PROJECT : Simmer and Jack Locomotive Move :

My file search tools tell me that I currently have just over 6500 photos taken around the Reefsteamers Depot alone, with another 4300 photos taken of Reefsteamers trips and our social gatherings, making over 10800 photos taken within 10 months. Maybe I should put in a claim for camera wear! Sometimes though, they get lost in the digital dog pile, although I do spend a night or more each week labeling and indexing the 250-450 photos that I usually take each Depot Weekend. Many of those photos, though, are duplicate shots from slightly different angles, flash settings, or with different shutter speed/aperture settings and get discarded.

But from that digital dog-pile, here are some photos that I'd forgotten that I had. They are of the Simmer and Jack locomotive move when the remarkably intact wooden hopper had just been winched onto the Sandstone Low Loader. We were called out on a rainy day to guide the truck out onto the main roads 📷 and were efficient in using the trip to get Steers burgers for lunch on the way home. The area was remarkably muddy, (As were Shaun's bakkie's rear seats) and very busy with careless traffic as the road used also serves a local rubbish tip.

There is no commentary as this wasn't our project and we were only there for a few minutes 📷 but kudos must go to the Sandstone Estates (Which operates as a company) for putting their heavy vehicles, staff and rigging equipment to the disposal of the Sandstone Heritage Trust to further the preservation of South Africa's Steam and narrow gauge equipment.





S01 (Prev. week) The Simmer and Jack wooden sided hopper is safely chained down and ready to go to its new, safe home in the Free State. That mud is genuine Germiston Gold Field Mud, not Sandstone Estates farm trackings.

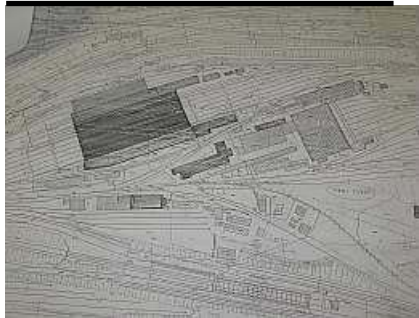


S02 (Prev. week) A classic arch-bar truck complete with quad coil springs. Note the wooden bolster beam and the unusual plain-bearing boxes.



S03 (Prev. week) On the move at last. The Sandstone Estates Freight Liner low-bed crawls cautiously out at about 20kph not because the load was too heavy, but because it was potentially top heavy even with chains.

Pictures from around the shed :



M01 No, this isn't a model railroad track plan. It's the official map of our Depot as it was when operational. The area towards the bottom of the drawing is the old coal stage. The dark building is the old running shed, which we now use as a carriage shed.



M02 This 28 year old dustbin is but a toddler compared to some of our buildings. The forge house was built in 1895 and the workshop was built in 1920. Our depot is old enough to be put under the heritage building act.



M03 One of the club chefs, Andre van Dyk smiles up from the braai area. Andre isn't able to come to the depot as often as he'd like, with two small children at home and a demanding IT job with much overtime. But he will often come in even just for a few hours to do a shorter job and cook lunch for the rest of the gang.



M04 A picture of the final sunset of steam that we're trying to delay and even reverse - two of five derelict Class 15F's take on the sullen glow of the setting autumn sun. (These locomotives belong to Transnet.)



M05 (Prev week) The grate rocker fingers from Class 15F No.3016 Gerdal wait next to the stacked grates.



M06 (Prev week) The Mole Patrol. Wilfred Mole (left) paid a combination business/social visit while the Simmer and Jack Locomotives were being moved. Here is actually looking at his GMAM Garret No.4079 Lyndie Lou which has been entrusted to Reefsteamers on behalf of SIA.



M07 One of the carriage jacks (With a padding disk) in storage at the Shongololo Express Tracks. These jacks are used to drop the bogies from under the coaches.



M08 Sanding rails the old fashioned way. Attie and Sakkie battled to get the Class 25NC 3472 Elize and the Class 15F No.3052 Avril swapped over on the wet, uphill yard lead. The Hunslet Shunter has no sanding gear/.



M09 Class 15F No.3052 Avril backs steamily towards the yard lead in the late evening. That's the forge house to the left. The loco was backed up just enough to clear the points before proceeding forward to run (very gingerly) around the loop to turn around.





M10 A large lathe makes a comfy seat for Shaun Ackerman (left) and Aiden Mc Carthy (right) as they wait for the 15CA to come into the workshop track. (The Top Shed was full at this time and we didn't want to leave the engine out in the gathering rain storm.)



M11 Putting an engine to bed. Class 15CA No.2056 backs into the workshop for a post trip service and motion greasing after the fire has just been dropped.



M12 The freshly painted formal club house. The interior has been completely rewired including a security system. A new toilet has been put in place awaiting plumbing and a presentation screen is in place.

End Piece :



EP01 - The end of a train at the end of the day. One of the sleeper coaches catches the sun as it waits in storage. The following day's train is actually the one visible just to the left.

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